UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/752,293	12/28/2000	Alex Chenchik	CLON017US1	6681

7590 06/19/2002

Bret E. Field
BOZICEVIC, FIELD & FRANCIS LLP
Suite 200
200 Middlefield Road
Menlo Park, CA 94025

EXAMINER
ZITOMER, STEPHANIE W

ART UNIT	PAPER NUMBER
1634	

DATE MAILED: 06/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/752,293	CHENCHIK ET AL.	
	Examiner	Art Unit	
	Stephanie Zitomer	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 April 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-13,15-19 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-13,15-19 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Application status

1. Receipt of the amendments filed April 11, 2002 is acknowledged.

2. All rejections applied in the previous Office action, paper no. 5, mailed January 29, 2002, have been withdrawn in view of the amendments to the claims, applicant's arguments and new grounds of rejection.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action

Rejections under 35 U.S.C. 103(a): Obviousness

3. Claims 1, 2, 5, 11, 12 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamb et al. (6,060,240) in view of Cronin et al. (6,045,996) and Chenchik et al. (5,994,076). Regarding claims 1, 11 and 19, Kamb et al. disclose a hybridization assay closely similar to that of the claimed invention comprising the steps of (a) generating a population of tagged target nucleic acids from an initial sample with a collection of at least 20 tagged primers; (b) contacting the population of tagged target nucleic acids with an array of tag complements immobilized on a solid support; (c) detecting any resultant hybridization complexes on the array wherein the initial sample comprises RNA (columns 40-41, claim 1; column 15, lines 39-50). The claimed invention assay differs from that of Kamb et al wherein the population of tagged target nucleic acids is generated with a collection of at least 20 tagged gene specific primers whereas Kamb et al. use random sequence or oligo(dT) primers (column 16, lines 36-60). However, it was routinely practiced in the art to generate target nucleic acid using sequence (gene) specific primers. For example, Cronin et al. teach the generation of labeled target nucleic acids to be captured on an array with gene-specific primers wherein the initial nucleic acid sample is RNA (column 6, lines 1-24 and 37-38). Chenchik et al. teach the generation of labeled target nucleic acids to be captured on an array with gene-specific primers wherein the initial nucleic acid sample is RNA (column 6, lines 39-49; column 7, lines 57-59; column 11, lines 15-20). It would have been obvious and the skilled practitioner in the art would have been motivated at the time the claimed invention was made to substitute gene specific primers as taught by Cronin et al. and Chenchik et al. for the random or oligo(dT) primers of Kamb et

al. in view the Kamb et al. teaching of using the assay for recovery of specific sequences (column 15, lines 44-50) as well as for the known benefits of assaying only desired sequences of interest, of ensuring that the specific intended target sequences are tagged and captured and of reducing false positive, spurious hybridizations.

Regarding claim 2, Cronin teaches that the gene-specific primers need not be used in an amplification step (column 6, lines 13-16) where sufficient sample is available. Furthermore, *In re Wilson and Benning* (CCPA) 153 USPQ 740 the Court held that it was obvious to omit a step from a reference process when its function was not desired; subject matter is not patentable in absence of showing of unexpected result flowing from such omission. (See penultimate paragraph, page 742.).

Regarding claim 5, the claimed assay embodiment wherein the tagged target nucleic acids are labeled is taught by Kamb et al. (column 17, lines 30-32) and by Cronin et al. and Chenchik et al. as previously stated.

Regarding claim 12, the claimed assay embodiment wherein labeled, tagged target nucleic acids are generated from at least two distinct nucleic acid samples is taught by Kamb et al. (columns 36-37, Examples 12 and 15) and by Chenchik et al. (column 2, lines 58-62).

4. Claims 3, 4 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamb et al. in view of Cronin et al. and Chenchik et al. as applied to claims 1, 2, 5, 11 and 12 above (paragraph 4), and further in view of Shannon et al. (6251,588) and Lockhart et al. (6,333,155). The claim 1 method embodiments of claims 3, 4 and 7-10 differ from that of Kamb et al. in view of Cronin et al. and Chenchik et al. wherein any difference in hybridization efficiency between any two tag/tag complements does not exceed about 10 fold (claim 3), about 5 fold (claim 7) or about 3 fold (claim 8) and wherein the level of cross-hybridization of any tag employed in the method does not exceed about 10% (claim 4), about 2% (claim 9) or about 1% (claim 10). However, the practice of minimizing cross-hybridization and thereby optimizing hybridization efficiency in the use of nucleic acid arrays was routine in the art at the time the claimed invention was made. For example, Shannon et al. provide a description of the prior art on the topic as well the rationale for optimizing hybridization efficiency of oligonucleotides in arrays (column 2, line 52-column 6, line 19).

Kamb et al. teach maximizing hybridization efficiency and minimizing cross-hybridization (column 15, lines 51-53; column 16, lines 5-27). Lockhart et al. address the need for optimizing the hybridization efficiency of oligonucleotides in an array as well as the problem of cross-hybridization: "it is recognized that hybridization efficiency varies with base composition and probe length" (column 14, lines 63-64) and "oligonucleotide probes in the high density array are selected to bind specifically to the nucleic acid target to which they are directed with minimal non-specific binding or cross-hybridization" (column 15, lines 64-67). Therefore, it would have been obvious and the skilled practitioner in the art at the time the claimed invention was made would have been motivated to select tag/tag complements having hybridization efficiencies with minimal differences and minimal cross-hybridization for the known benefit of maximizing hybridization results and reducing sperious fal positive hybridiations. In *In re Aller*, 105 USPQ 233, the court found that changes of an old process within the broad teaching of the prior art does not impart patentability in the absence of unexpected results.

5. Claims 13, 15-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamb et al. in view of Cronin et al. and Chenchik et al. and further in view of Shannon et al. and Lockhart et al. as applied to claims 1-5 and 7-12 above (preceding paragraphs 3-5) and further in view of Brown et al. (Nat. Gen. Suppl. 21:33-37, Jan. 1999). Regarding claims 13 and 15-18, it was routinely practiced in the art to provide assay- specific reagents in kit form for convenience of performing a particular assay as well as for commercial application. For example, Chenchik et al. teach the embodiment wherein the array of distinct tag complements, the set of at least 20 distinct tagged gene specific primers having tag domains known to be complements of the tag complements on the array and means for identifying the location on the array to which each tagged gene specific primer hybridizes are provided in kit form (column 13, lines 4-28). The claimed invention kits and arrays differ from those of Kamb et al. in view of Cronin et al. and Chenchik et al. in the embodiments of claims 15, 16 and 19 wherein the magnitude of difference in hybridization efficiency between any two tag/tag complement pairs does not exceed about 10 fold and any tag in the set of tagged affinity ligands has a level of cross-hybridization with respect to the array that does not exceed 10%. However, the practice of minimizing cross-

hybridization and thereby optimizing hybridization efficiency in the use of nucleic acid arrays was routine in the art at the time the claimed invention was made. For example, Shannon et al. provide a description of the prior art on the topic as well the rationale for optimizing hybridization efficiency of oligonucleotides in arrays (column 2, line 52-column 6, line 19). Lockhart et al. address the need for optimizing the hybridization efficiency of oligonucleotides in an array as well as the problem of cross-hybridization: "it is recognized that hybridization efficiency varies with base composition and probe length" (column 14, lines 63-64) and "oligonucleotide probes in the high density array are selected to bind specifically to the nucleic acid target to which they are directed with minimal non-specific binding or cross-hybridization" (column 15, lines 64-67). Therefore, it would have been obvious and the skilled practitioner in the art at the time the claimed invention was made would have been motivated to select tag/tag complements having hybridization efficiencies with minimal differences and minimal cross-hybridization for the known benefit of maximizing hybridization results. In *In re Aller*, 105 USPQ 233, the court found that changes of an old process within the broad teaching of the prior art does not impart patentability in the absence of unexpected results.

Regarding claims 17 and 18, the claimed invention kit differs from that of Kamb et al. in view of Cronin et al. and Chenchik et al. wherein the means for identifying the physical location on the array comprises a medium that includes identifying information or a means for remotely assessing the information is provided in the kit wherein the latter is a website address. However, it would have been obvious and the skilled practitioner in the art would have been motivated at the time the claimed invention was made to include printed information such as a website address in the kit in view of routine practice in the art of accessing public nucleotide sequence databases for sequence searching for the obvious benefit of obtaining a large amount of sequence information in a readily available format. For example, Brown et al. teach that the use of molecular arrays generates a large amount of information which may be managed and published via websites and Kamb et al. teach that databases, sequence analysis packages, etc., are available via the Internet to solve the problems of data storage and sequence analysis (column 28, lines 23-26).

Regarding claim 21, the claimed invention array differs from that of Kamb et al.in view of Cronin et al. and Chenchik et al. wherein the array has a density that does not exceed about 400 spots/square cm. However, oligonucleotide arrays routinely used in the prior art were known to have densities ranging from less than 100 to more than 1000 spots per square cm. Therefore, one of ordinary skill in the art at the time the claimed invention was made would have been motivated according to personal preference to select an array density appropriate to particular experimental parameters for the obvious benefit of optimizing results.

Provisional double patenting obviousness-type rejection

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claims 1-5, 7-13, 15-19 and 21 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 4-9, 13, 16, 18-22 and 24 of copending Application No. 09/752,292. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed subject matter, hybridization assays on arrays via nucleic acid tag/tag complements. The '293 claims differ from those of the '292 application wherein the target is nucleic acid

SE 6-12-02

and the tagged nucleic acids are generated using gene specific primers. However, the use of gene, i.e., sequence, specific primers for generating specific nucleic acids of interest was known in the art, for example, as taught by Cronin et al. (6,045,996) (column 6, lines 1-16) wherein an amplification step may be omitted, and as taught by Chenchik et al. (column 6, lines 39-49; column 7, lines 57-59; column 11, lines 15-20). It would have been obvious to the skilled practitioner in the art to limit the target nucleic acids in the '292 assay to gene specific sequences for the known benefits of assaying only desired sequences of interest and reducing false positive spurious hybridizations. Additional embodiments of the assay method are the same in both application claim sets.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

7. No claim is allowed.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephanie Zitomer whose telephone number is (703) 308-3985. The examiner can normally be reached on Monday through Friday from 9:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, W. Gary Jones, can be reached on (703) 308-1152. The official fax phone

number for this Group is (703) 308-4242. The unofficial fax number is (703) 308-8724. The examiner's Rightfax number is 703-746-3148.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196. For questions and requests relating to formal matters contact Patent Analyst Tiffany Tabb at 703-605-1238.

SEZitomer

Stephanie Zitomer, Ph.D.
June 12, 2002

PRIMARY EXAMINER